



Pump Control

Introduction

Pumps are used to feed networks where adequate supply cannot be maintained from gravity fed sources. Pumps require large, costly amounts of electricity to power and often do not provide any intelligent control over their pressure output. Modulation of variable speed pumps brings many benefits.

Significant electricity savings - There are drivers worldwide to reduce carbon emissions and other impacts on our environment. The utilities, have a major impact on the environment and as such have a responsibility to make efforts to reduce this impact and strive for sustainability.

Reduced leakage and burst occurrence - It is generally acknowledged that reducing pressure in the mains reduces leakage rates and frequency of bursts. Although research work is still proceeding to quantify the effects of pressure reduction, its effectiveness is no longer in doubt.

Network control - Whilst pressure reduction is beneficial, high pressure may need to be fed into districts to counteract the increasing 'head loss' due to ageing pipes, naturally rising leakage and growth in demand. Increased pressure may also be required during temporary periods of exceptional demand or events. The challenge in pressure management is to address the conflicting requirements by applying the optimum pressure within the network at all times.

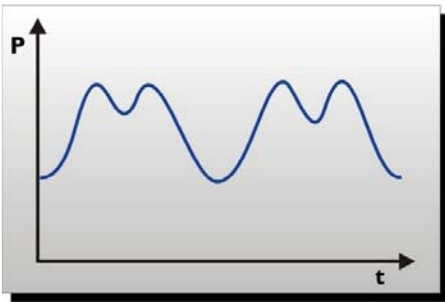
Increased asset life - Mains replacement is an expensive process which leads to significant highway disruption and is usually considered as a last resort. Wherever possible, water companies have sought to maintain their networks at an acceptable efficiency and performance level to defer replacement. Reduced pressure on the network has been shown to increase the life of assets in the network.



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Advanced Pressure Control

In an ideal distribution system, the regulator device supplying the district should supply only sufficient pressure to maintain the necessary minimum pressure at the critical node. A pump controller can accurately achieve this by monitoring network parameters, and control the pump set point accordingly, as shown below:



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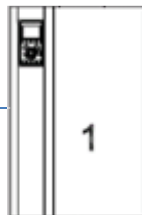
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When used in conjunction with a pump set, three typical control modes can be used to optimise network pressure:

(a) **Time-based profile modulation:** The controller adjusts the Pump outlet pressure with respect to the time of day.



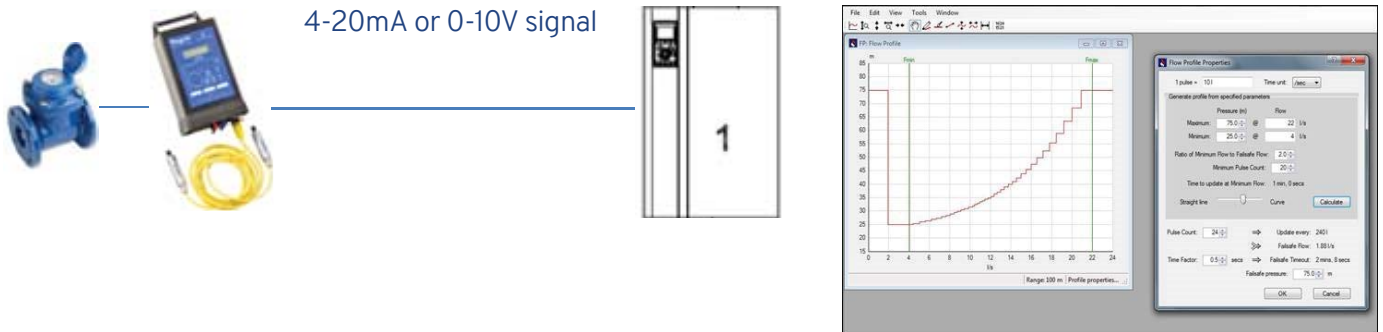
4-20mA or 0-10V signal



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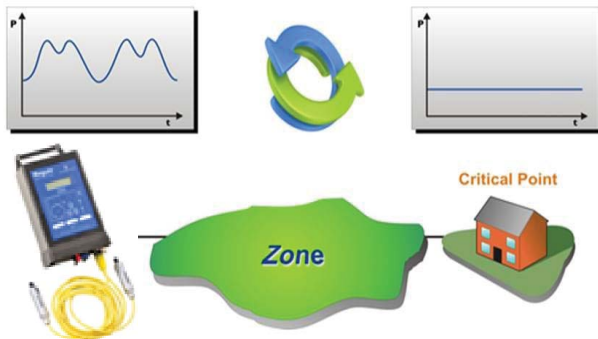
Technology

(b) **Flow based modulation:** The controller monitors the flow rate and adjusts the pump outlet pressure with respect to flow rate according to a 'flow rate vs pressure' profile entered by the user.



(c) **Closed Loop:** Here the controller is permanently connected to the communication network. The controller is capable of modulating the outlet pressure of a pump by receiving alarm messages DIRECTLY from one or more data loggers located at critical points within the network.

Closed loop control may be performed without the need of a central server.



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Product Technical Matrix

	Regulo Pump Controller
Service	Water
Mode of Communication	Local / 2G
User Accessible SIM	Yes
User Replaceable Battery	Yes
Available Channels	8
Optional Pressure Inputs	2
Supported Pressure Recording Strategies	I / A / S
Optional Temperature (PT-100) Inputs	0
Available Digital Inputs	2
Available Analogue Inputs	0
Internal / External Supply	Internal & External
Powering of Third Party Sensors	No
WITS Compliance	Yes
Intrinsically Safe	No
Protection Class	IP 68
Level Monitoring Capability	Float Switch

Key: Pressure Recording Strategy (I - Instantaneous / A - Average / S - Statistical / T - Transient)